

a probability in the centralized distribution model. In contrast, the switch fabric network matrix will make high bandwidth demanding applications as close as a local network switching node device.

5 **[0114]** However, it is not only video rentals for high bandwidth applications such as video-on-demand that can be stored locally. It is also an aspect of the invention to cache commonly accessed web sites in local network switching node devices. A single local node can even
10 perform the task of obtaining updates of web sites. Then, the local node can inform other local network switching node devices that the web site data can be downloaded from its mass storage device, instead of each local network switching node device retrieving the same data through a
15 trunk line. This action substantially decreases access through the trunk line.

20 **[0115]** Because the need for high volume traffic through a trunk line to the Internet or other networks is decreased, another advantage of the switch fabric network matrix is to reduce the need for trunk lines having a large bandwidth. Thus, the total number and the size of the trunk lines can be kept to a minimum, or existing

trunk lines can have their useful lifespan extended.

[0116] Another advantage of the present invention is easily providing the capability of expansion. Consider a local network comprised of 100 users. As the number of users on a local network grows, capacity of the local network is increased by adding local network switching node devices to the switch fabric network matrix.

Accordingly, each communication line between local network switching node devices maintains the same bandwidth, and is not progressively increasing.

[0117] Another aspect of the invention is the ability to handle guaranteed access. This scenario can be described by considering the traditional tree structure shown in figure 7. Utilizing T1 and fractional T1 configurations often provide telephone service, as well as Internet access. Disadvantageously, the traditional tree structure handles quality of service from the trunk to the roots. This is backwards because of the previously described congestion and saturation problems. Saturation will occur at the roots of the tree. The remaining nodes do not have any bandwidth available to them for accessing the trunk line.

[0118] The switch fabric network matrix shown in figure 8 solves the problem of being cut-off from all access to a trunk line. The present invention reserves bandwidth for telephone services at the port level of each Open IP Services Platform, or network switching node device in the switch fabric network matrix. This reservation of bandwidth is made from the outermost edges of the switch fabric network matrix, and on up.

[0119] Another advantage of the present invention is illustrated as Table 1. Table 1 is a cost analysis of providing broadband services using the state of the art centralized distribution network as currently implemented, as compared to utilizing the switch fabric network matrix of the present invention. The costs describe delivering the services for video-on-demand to 200,000 homes. Essentially, the total savings are \$24 Million dollars utilizing the switch fabric network matrix of the present invention.

[0120] It is to be understood that the above-described arrangements are only illustrative of the application of the principles of the present invention. Numerous modifications and alternative arrangements may be devised